
Gender and CEO Compensation

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Gender and CEO Compensation

Abstract

The gender pay gap issues have long been debated. Prior research has shown significant or insignificant relations between gender differences on pay gap. This paper focuses on studying the relation of CEO gender on CEO compensation. We examine whether gender is related to both base salary and total compensation of CEOs. Further, by controlling for firm-fixed effect, we are able to come close to better understand the relation between gender and CEO compensation. In essence, firm-fixed effect analysis allows us to analyze whether in a particular company the gender of the CEO matters. Hence, whether a firm that employed a male CEO and a female CEO at some time during the sample period has shown variation in compensation that can lead us to suspect that it discriminated in compensation between males and females.

The result of our paper finds no significant impact of gender difference on either base salary or total compensation of CEOs. However, there is a difference that we find in the salary mix - Female CEOs are statistically paid more in terms of base salary, which means the performance-based compensation of female CEOs is lower than their male counterparts.

Key Words: CEO Gender, CEO Base Salary, CEO Compensation, Firm Fixed Effect, Regression

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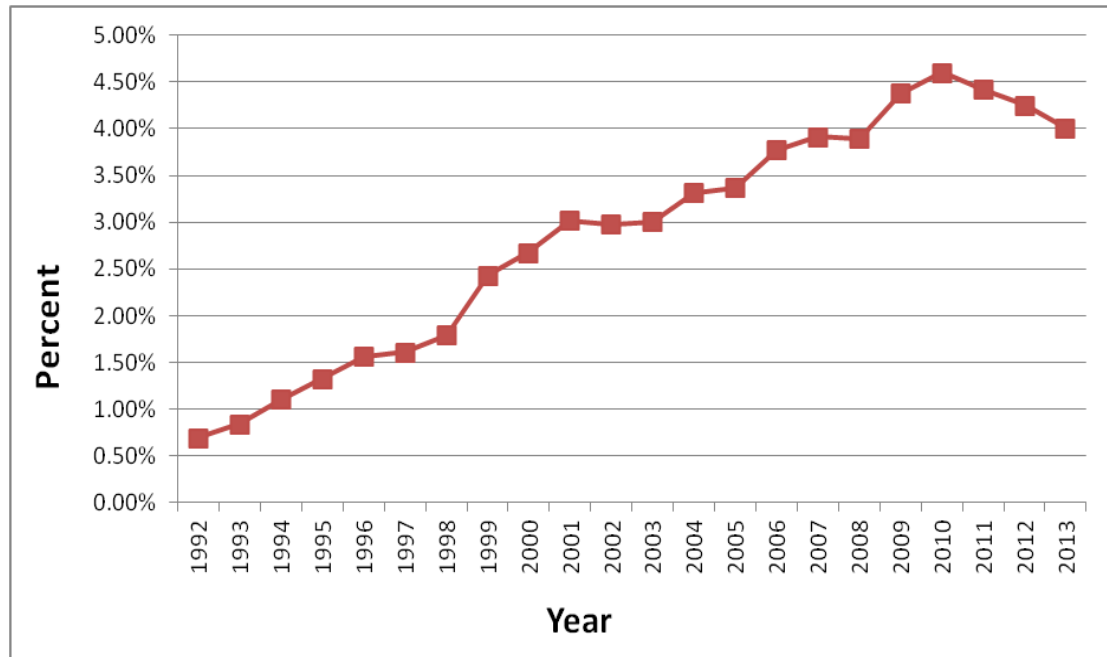
Introduction

Gender difference in compensation has long been a controversial issue and many people assert that gender discrimination is an important obstacle for gender equality. In this study we try and address the possibility of a gender gap in CEO pay. On the fact of it, the argument of discrimination against woman is not without its critics. Women may earn on average less because they are employed at lower levels in the company. Because women often need to balance family and work life, it is not inconceivable that they are systematically less career oriented, leading to the systematic difference on pay. Controlling with different characteristics such as tenure and age may not suffice, because there may be unobservable systematic effort differences associated with gender (hence, women putting less effort in job and more effort in family). However, these explanations are less convincing when discussing pay of CEOs. By definition, CEOs are the most work oriented employees. They constitute the left tail of the pay distribution. A women CEO, who reached such a position cannot be considered family oriented as she had to surpass men to get to that position. Hence, a gender pay gap at the CEO level would suggest discrimination.

Our sample of S&P 1500 firms (Execucomp firms) shows that the number of female CEOs has increased steadily over latest 20 years as shown in Figure 1. It also shows that the percentage of CEOs that are women increased. We find that the percentage increased over the time span 1992 to 2010 but dropped slightly in recent years till 2013. Initially, the percent of female CEOs was only 0.69% in 1992. Then it doubled to 2.43% 8 years later. After that, it began to flatten out at 3% in the following two

years. Then, it peaked at 4.3% in 2010, followed by a slight fall to 3.5%.

Figure 1 Female as a Percent of All CEOs



In this article, we discuss the relationship between CEO gender and CEO compensation in a comprehensive aspect. We regress a sample of female and male CEOs compensation from 1992 to 2013. Besides, we add a series of controlling variables to reduce the concern of omitted variable bias. These variables include yearly dummy variables, CEO characteristics, industry dummy variables and firm characteristics. The more the controlling variables we added in the regression model, the smaller the sample is. However, we still maintain a large size sample consisting of 11694 year-CEO observations. We also implement firm-fixed effect which reflects how female and male CEOs employed in the same company relate in terms of compensation. In this firm-fixed effect, we examine how gender relates to compensation in each firm, and we get a much higher adjusted R-square. Finally, we conclude that gender has no significant impact on compensation but with the base

salary and total compensation of female CEOs slightly lower than male CEOs when controlling years, CEO characteristics, and firm characteristics. This result actually means the compensation gap resulting from gender difference is negligible. On the other hand, we find a difference in salary mix – Female CEOs are paid a higher salary proportion in total compensation, while male CEOs have less amount of compensation made of fixed salary, which suggests that female CEOs have less performance-based compensation than male CEOs; the difference is statistically significant (t-statistic is 1.77).

1. Review of literature

Our paper is mainly motivated by prior literature released by Martin Bugeja, Zoltan P. Matolcsy, Helen Spiropoulos (2011). This study provides a background analysis of CEO gender and CEO compensation. They find no gender discrimination on compensation, including salary, bonus and total pay exist for female CEOs. Also, they stated that the minor difference on bonus paid to CEOs is not consistent with the popular assertion that females are risk-averse. Besides, Gender differences in CEO compensation: evidence from USA authored by Susan M.Adams, Atul Gupta, Dominique M.Haughton and John D.Leeth (2007) utilizes ExecuComp database of executives at 1,500 large US corporations from 1992 to 2004. This paper indicated that female CEOs were on average younger than male CEOs and female received similar compensation as male do at CEO level. On contrary, females received less compensation than males prior to them become CEO. Similarly, Jordan et al (2007) pointed out that the influence of gender differences on payments for CEOs does not

exist but does exist for lower level executives. Mohan and Ruggiero (2003) found an interesting phenomenon that if option is excluded from compensation, female CEOs are not underpaid compared to male CEOs, but if it is included, women CEOs are underpaid compared to their male counterparts.

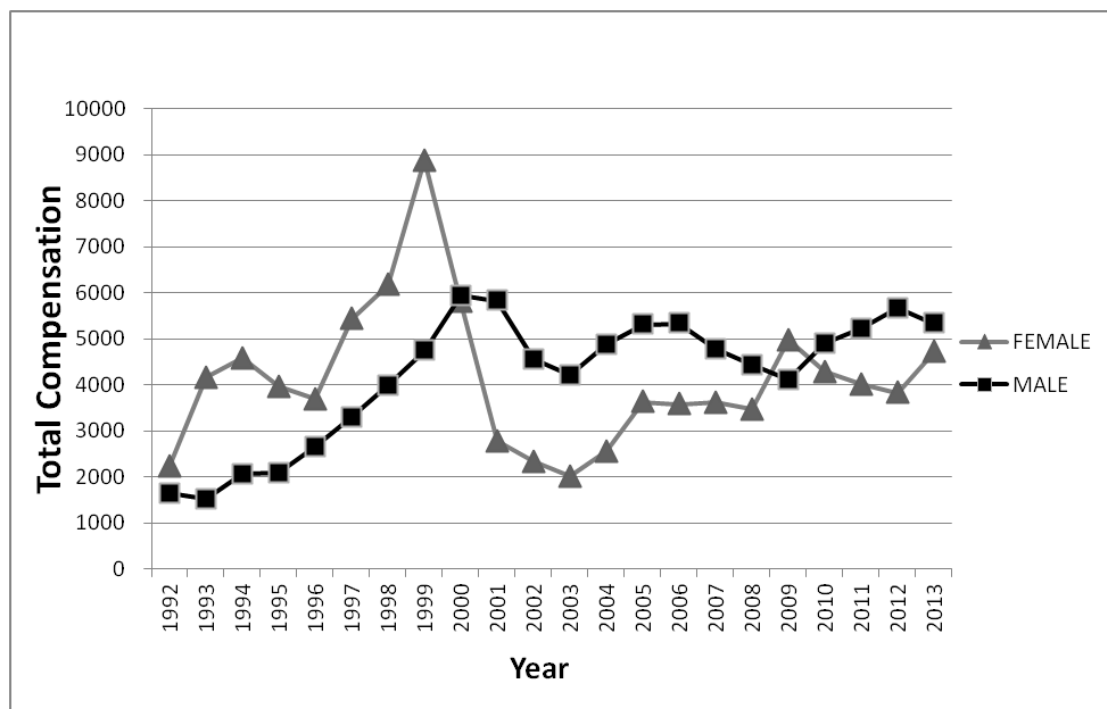
Prior literature about the relation between CEO gender and CEO compensation is limited and we also refer to papers concerning executives' gender and their compensations. Gender differences in executive compensation: Variation with board gender composition and time written by Susan Elkinaway, Mark Stater (2009) used the same database as we did, but they only worked with time span from 1996 to 2004, which is much shorter than that of our sample. Their research objective is executives instead of CEO solely. They found an interesting result that larger firms are usually more male-dominated and females who climb to the top executive board work in small company in general. Also, they found female executive earn 4.5% to 5.5% less than male executives in base salary. Vieito and Khan (2012) documented that the gap of executives' compensation diminished from 2000 and they found no significant differences in stock options awarded to male versus female executive. In this paper, the author additionally focused on technology companies since their CEOs, no matter female or male, are required similar skills and knowledge based on the unique professionalism of this area. The conclusion showed that in technology area, men and women executives have statistically insignificant difference on total compensation.

2. Sample

The analysis of gender and CEO compensation utilizes the WRDS Compustat

(Execucomp). In this database, a variety of information is provided, including annual compensation statistics such as each executive's salary, total direct compensation (including salary, bonuses, the total value of restricted stock granted, the total value of stock options granted, long-term incentive payouts and all other total annual compensation), gender, job title, tenure as CEO, and company financial statistics such as sales and industry classification. We filtered the data downloaded by sorting out titles and unavailable total compensation, and only treated Chief Executives Officer (CEO) as our target, the processed data sample contains 1385 women and 48729 men employed as a CEO based on WRDS Compustat (Execucomp).

Figure 2 Average CEO Compensation by Gender, 1992-2013



As illustrated in Figure 2, the difference in CEO compensation between men and women has changed over time. Before 2000, the average female CEOs earned more than her male counterparts. The difference in 1999 is particularly significant, which

was about 4 million in total amount of direct compensation. During a 4-year period after 2000, the difference between female and male CEOs became minor, when female CEO got paid slightly less. Then, female CEOs' compensation shrunk, considerably lower than their male counterparts between 2000 and 2008. However, in recent years, compensation gap narrowed again with a trend that female CEOs' compensation rose and approached to a similar compensation position in which male CEOs have been.

3. Descriptive statistics

According to Table 1, female CEOs have higher significant base salary and higher insignificant log base salary than their male counterparts, whereas the log total compensation difference on female CEOs and male CEOs are insignificant. The fact that female CEOs having higher base salary but statistically equal total compensation implies their commission-based proportion of compensation (such bonus and option grants) is lower than their male counterparts. In addition, female CEOs are just under 60 years old on average, about 7 years younger than the average age of male CEOs. Further, female CEOs on average have 2 years shorter tenure than their male counterparts. The differences in ages and tenures are significant from a statistics perspective.

Sales, number of employees and market value are used to measure the size of a firm; return on asset, three-year growth rate of sales and three-year return to shareholders are proxies of corporate performance.

Table 1 Descriptive Statistics on Compensation, CEO and Firm Characteristics

| Variables | Full Sample | Male CEOs | Female CEOs | Difference in Means (t-statistic) |
|--|-------------------------|-------------------------|-------------------------|--------------------------------------|
| Compensation (<i>n</i> = 50114) | | | | |
| Base Salary (\$ thousands) | 582.41 (374.570) | 581.86 (375.313) | 601.70 (347.003) | -19.84 (-2.42)* |
| Log Base Salary (\$ thousands) | 2.69 (0.280) | 2.69 (0.280) | 2.71 (0.268) | -0.02 (0.47) |
| Total Compensation¹ (\$ thousands) | 3,885.53 (7,409.523) | 3,888.34 (7,449.545) | 3,786.89 (5,830.309) | 101.44 (0.59) |
| Log Total Compensation (\$ thousands) | 3.30 (0.495) | 3.30 (0.496) | 3.32 (0.464) | -0.02 (-1.60) |
| CEO Characteristics (<i>n</i> = 19401) | | | | |
| Age | 66.66 (9.187) | 66.81 (9.187) | 59.47 (5.648) | 7.34 (2.64)** |
| CEO Tenure² (Year) | 8.53 (7.159) | 8.56 (7.184) | 6.83 (5.622) | 1.73 (2.79)** |
| Firm Characteristics (<i>n</i> = 13618) | | | | |
| Sales (\$ billions) | 3.63 (9.441) | 3.65 (9.485) | 2.63 (4.684) | 1.01 (0.90) |
| Number of Employees (# thousands) | 17.38 (42.362) | 17.43 (42.547) | 12.73 (22.589) | 4.70 (2.50)* |
| Market Value (\$ billions) | 4.29 (12.402) | 4.30 (12.454) | 3.30 (6.984) | 1.00 (0.68) |
| Rate of Return on Assets (%) | 3.56 (11.086) | 3.55 (11.021) | 4.17 (15.476) | -0.62 (3.40)** |
| Three-year growth rate of sales (%) | 17.92 (89.461) | 17.96 (89.984) | 14.33 (20.591) | 3.63 (2.69)** |
| Three-year return to shareholders (%) | 15.15 (25.505) | 15.15 (25.486) | 14.78 (27.030) | 0.38 (2.69)** |

Notes: Each cell in the first three columns includes the mean value and the standard deviation (in parentheses), parentheses in the last column stands for t-statistic. Sample size is also provided.

* Difference in means is significant between genders at 5% level.

**Difference in means is significant between genders at 1% level.

We found that firms managed by female CEOs are not necessarily significantly

¹ Total Direct Compensation includes base salary, bonuses, restricted stock grants, stock option grants, long-term incentive pay and all other forms of total annual compensation.

² CEO Tenure represents the number of years in the position of CEO.

smaller but significantly behaved worse than those managed by males, proved by worse sales, small market value, slower growth rate and lower return to shareholders. However, one exception is firms having female CEOs have performed approximately 0.62% better in rate of return on asset. Therefore, the conclusion is the base salary differs because of gender, but not true for total direct compensation.

4. Methodology and hypotheses

The research on the relation between gender and CEO compensation considering a series of CEO and firm characteristics is based on the regression model shown below.

$$\begin{aligned} \log Y_i = & \beta_0 + \beta_1 Fem_{CEO} + \sum \beta_j CEO\ characteristics_i \\ & + \sum \beta_k Firm\ Size\ characteristics_i + \sum \beta_l Industry\ indicators_i \\ & + \sum \beta_m Year\ indicators_i + \sum \beta_n Firm\ indicators_i + \epsilon_i \end{aligned}$$

Y_i stands for either the base salary or total compensation. The purpose of taking the natural logarithm is to reduce the impact of outliers. Log will decrease the skewness of the dependent variable and better mimic a normal distribution that is critical for regression analysis. Total compensation is composed of CEO's salary, bonus and compensations such as the value of stocks or options granted. β_0 is the intercept. β_1 is a dummy variable that equals to one if the CEO is a woman or zero if the CEO is a man. β_j to β_n are coefficients associated with variables describing the characteristics of CEO, firm, industry and year. ϵ_i is a zero mean error term that is uncorrelated with the independent variables presented in the regression model. Also, it is noteworthy that compensation is adjusted for inflation when we processed the regression.

4.1 CEO characteristics

CEO characteristics includes CEO's age, age square, tenure (years as CEO) and tenure square, which are used to quantify CEO's managerial experience and executive power. We calculated the square of age and tenure here is to examine the values of coefficients of these square terms, which describe the rate of change of total compensation or base salary as the age and tenure change at that point.

4.2 Firm characteristics

Firm characteristics are used for controlling for the size of a company or measuring corporate performance managed by a CEO. They are composed of net sales, market value, and number of employees, rate of return on asset (ROA), three-year growth rate of sales and three-year return on shareholders.

Table 2 Average Salaries and Compensation by Gender and Industry, 1992-2002

| Industry | N | Fem. CEO | % of N that are Fem. | % of Fem. in Industry | Avg Salary | Avg Salary Fem. | Avg Salary Male | Avg TC | Avg TC Fem. | Avg TC Male |
|----------------------------|------|-------------|----------------------------------|--------------------------------|---------------|-----------------------|-----------------------|-----------|-------------------|-------------------|
| Agriculture | 55 | 0 | 0.00% | 0.00% | 316 | 0 | 316 | 1489 | 0 | 1489 |
| Mining | 479 | 0 | 0.00% | 0.00% | 440 | 0 | 440 | 2184 | 0 | 2184 |
| Construction | 107 | 0 | 0.00% | 0.00% | 510 | 0 | 510 | 4061 | 0 | 4061 |
| Manufacturing | 5534 | 48 | 0.87% | 29.27% | 527 | 902 | 523 | 3313 | 10923 | 3246 |
| Transportation | 1568 | 5 | 0.32% | 3.05% | 499 | 566 | 499 | 3453 | 5049 | 3448 |
| Wholesale Trade | 360 | 0 | 0.00% | 0.00% | 455 | 0 | 455 | 2702 | 0 | 2702 |
| Retail Trade | 1166 | 63 | 5.40% | 38.41% | 531 | 460 | 535 | 2989 | 1787 | 3057 |
| Finance | 1213 | 7 | 0.58% | 4.27% | 603 | 323 | 605 | 5502 | 661 | 5530 |
| Services | 1523 | 41 | 2.69% | 25.00% | 448 | 393 | 450 | 4070 | 2719 | 4108 |
| Non-classified | 89 | 0 | 0.00% | 0.00% | 604 | 0 | 604 | 5481 | 0 | 5481 |

4.3 Industry indicators

Based on the SIC (Standard Industrial Classification) codes, data are divided into 100 industrial sub-groups (the first two digits from 01 to 99)¹. For the sake of brevity, they are classified into ten groups, shown in Table 2 and Table 3. The industries with the highest number of CEOs are manufacturing and services in each of the sample period. More specifically, the industries having the highest percentages of female CEOs are retail trade, services and finance, while no female CEOs are employed in agriculture, mining, construction and wholesale trade. Furthermore, by comparing Table 2 with Table 3, we found that the number of female CEOs in each industry increased substantially and the amount of average salary and average compensation for women are increasing from first to the second time period. Surprisingly, salaries and compensation in industries that relatively have higher percentage of female CEOs are not as low as people expected resulting from a concept of gender discrimination on compensation. Particularly, in finance, which ranks 1st in both average salary and average compensation and 2nd in average compensation during the first half and second half of the period respectively, many female CEOs are employed. Also, it's interesting to notice that the percentage of female CEOs in the industry is actually positively correlated with the average salary in the industry in each period (the simple correlation coefficients are 0.13 and 0.42, respectively), but is changing from a negative correlation to a positive correlation with average compensation (the simple correlation coefficients are -0.02 and 0.34 in the first and second period). Thus,

¹ Data are according to United States Department of Labor (https://www.osha.gov/pls/imis/sic_manual.html).

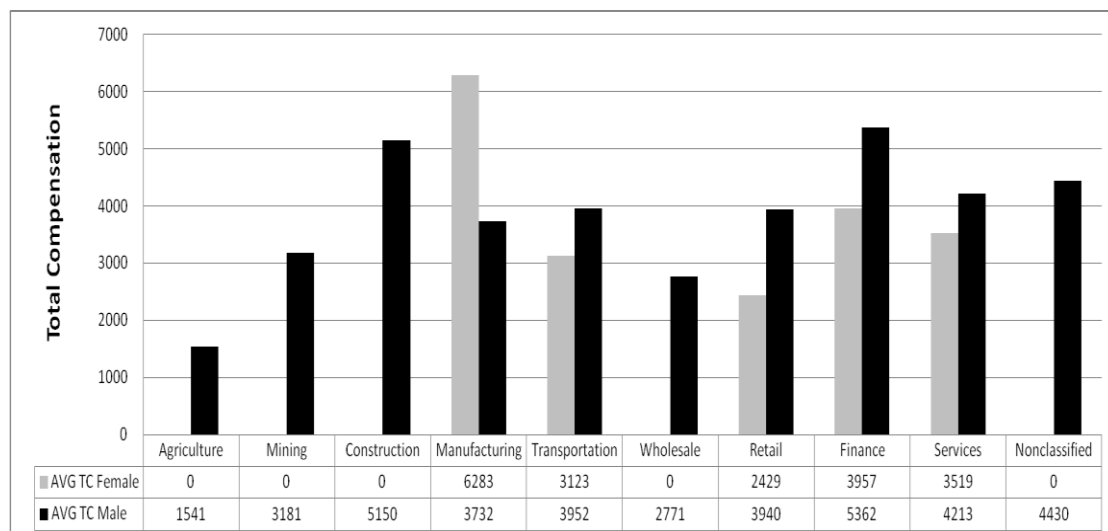
female CEOs are more concentrated in particularly high-paying industries.

Table 3 Average Salaries and Compensation by Gender and Industry, 2003-2013

| Industry | N | Fem. CEO | % of N that are Fem. | % of Fem. in Industry | Avg Salary | Avg Salary Fem. | Avg Salary Male | Avg TC | Avg TC Fem. | Avg TC Male |
|------------------------|------|----------|----------------------|-----------------------|------------|-----------------|-----------------|--------|-------------|-------------|
| Agriculture | 3 | 0 | 0.00% | 0.00% | 255 | 0 | 255 | 2490 | 0 | 2490 |
| Mining | 315 | 0 | 0.00% | 0.00% | 616 | 0 | 616 | 4697 | 0 | 4697 |
| Construction | 73 | 0 | 0.00% | 0.00% | 778 | 0 | 778 | 6746 | 0 | 6746 |
| Manufacturing | 3198 | 81 | 2.53% | 33.20% | 678 | 577 | 681 | 4559 | 3534 | 4586 |
| Transportation | 675 | 13 | 1.93% | 5.33% | 724 | 670 | 725 | 5089 | 2381 | 5142 |
| Wholesale Trade | 195 | 0 | 0.00% | 0.00% | 633 | 0 | 633 | 2898 | 0 | 2898 |
| Retail Trade | 809 | 76 | 9.39% | 31.15% | 736 | 625 | 747 | 5051 | 2960 | 5268 |
| Finance | 979 | 34 | 3.47% | 13.93% | 684 | 663 | 684 | 6009 | 4635 | 6058 |
| Services | 1224 | 40 | 3.27% | 16.39% | 605 | 552 | 607 | 4346 | 4338 | 4346 |
| Non-classified | 25 | 0 | 0.00% | 0.00% | 329 | 0 | 329 | 688 | 0 | 688 |

To make it more clear, the comparison of female CEOs and male CEOs is demonstrated in the following bar chart (Figure 3). As a whole, female CEOs are not employed in low-paying industries such as agriculture, mining, and wholesale.

Figure 3 Average CEO Compensation by Major Industry and Gender, 1992-2013



Also, industries including wholesale trade and non-classified don't have CEOs that

are women. For industries that both employ female and male CEOs, female CEO earns less in transportation industry, retail trade industry and finance industry while only gets paid more in manufacturing industry.

5. Regression result

5.1 Base salary regression

In Table 4, all estimates for the values of coefficients of independent variables are presented. This regression model is used for studying the relation between log base salary and characteristics of CEO and firm. The first column suggests female CEOs have earned slightly higher than male CEOs; the difference is statistically insignificant. The result implies that age, age squared, tenure and tenure squared have significant impact on CEO base salary. A senior CEO is more experienced and tends to earn a higher base salary. However, the marginal effect of age is reducing as learned by negative coefficient on the squared age term. Similar results obtained for tenure – tenure increases compensation but the marginal effect of tenure is reducing. As one may expect, size is positively associated with compensation. Similarly, it is noteworthy that if a firm has more employees, CEOs' base salary is statistically higher. This may be because larger firms can provide greater employment stability and more competitive compensation. Also, if a firm has a higher 3-year growth rate, CEOs' base salary is slightly lower. An explanation of this fact is that CEOs are willing to sacrifice part of their base salary to boost the long-term development of a company, or CEOs earn higher performance-based compensation to substitute the loss of base salary. To reduce concerns of omitted variables bias, we controlled different firms.

Table 4 Regression Results of Base Salary for CEO

| Independent variables | Y=log base salary | | | |
|--------------------------------------|-------------------|-------------------|-------------------|------------------|
| | (1) | (2) | (3) | (4) |
| <i>CEO characteristics</i> | | | | |
| Female | 0.0103(0.75) | -0.0080(-0.58) | -0.0063(-0.30) | -0.0446(-0.52) |
| Age | 0.0213(9.06)** | 0.0185(8.01)** | 0.0299(11.62)** | 0.0347(8.43)** |
| Age squared | -0.0001(-6.10)** | -0.0001(-5.21)** | -0.0002(-9.03)** | -0.0002(-7.14)** |
| Tenure | 0.0170(25.77)** | 0.0164(25.15)** | 0.0074(16.25)** | 0.0104(14.44)** |
| Tenure squared | -0.0004(-20.63)** | -0.0004(-19.42)** | -0.0001(-16.73)** | -0.0001(-6.30)** |
| <i>Firm characteristics</i> | | | | |
| Sales | | | 0.0000(11.41)** | 0.0000(4.96)** |
| # of Employees | | | 0.0006(7.55)** | 0.0002(1.92) |
| Market Value | | | 0.0000(4.09)** | 0.0000(-1.97) |
| Return on Assets | | | 0.0001(8.49)** | 0.0004(3.82)** |
| Sales 3 Yr Growth Rate | | | -0.0001(-5.49)** | 0.0000(0.17) |
| 3 Yr Ret to Shareholders | | | 0.0002(1.73) | 0.0003(4.56)** |
| Constant | 1.484(18.93)** | 1.586(20.56)** | 1.182(13.04)** | 0.939(6.27)** |
| Firm control? | NO | NO | NO | YES |
| Firm characteristics control? | NO | NO | YES | YES |
| Industry control? | NO | YES | YES | YES |
| Year control? | YES | YES | YES | YES |
| Observations | 19302 | 19302 | 11694 | 11694 |
| Adj. R-squared | 0.142 | 0.190 | 0.271 | 0.626 |
| Standard error | 0.274 | 0.265 | 0.238 | 0.170 |

Notes: The dependent variable is the natural logarithm of base salary and salary figures are deflated by the annual Consumer Price Index (CPI) for each year (base year is 1992).

Firm control in column 4 is according to GVKeys; industry control is by 2-digit SIC code.

Robust t-statistics are presented in parentheses.

*Estimated coefficient or T-statistic is significantly different from zero at 5% level.

**Estimated coefficient or T-statistic is significantly different from zero at 1% level.

Age and tenure variables are still significant, while some firm characteristics become

insignificant. Overall, the adjusted R-square of these regression models increased and rockets to 62.6% when firms are controlled in our regression model. The result shows that female dummy variable remains insignificant all the time, suggesting that gender issue is not important for CEO compensation.

5.2 Total compensation regression

As can be seen from Table 5, female CEOs earned less than otherwise identical male CEOs when considering all variables (shown in column 4) but this difference is not significant in statistics. Alternatively, this means gender is not an issue relating to CEOs' total compensation, the same conclusion drawn from log base salary regression.

Other control variables are as follows. Age and tenure (years as CEO) increases total compensation but does so at a decreasing rate, since the values of coefficients on them are positive but on squared them are negative. Sales and three-year return to shareholders raise CEO compensation somewhat and have significant effect at the same time.

Moreover, to see whether there are still remain unobservable effects that vary across firms but are constant over time, we redid the analysis using firm-fixed effect and considering different firms as control variables (column 4). We uncovered that not only the results on total compensation did not change but also it fits the regression model more finely (which can be drawn from the huge increase in adjusted R-square). In brief, the regression results provide no support for a gender-based difference in CEO compensation.

Table 5 Regression Results of Total Compensation for CEO

| Independent variables | Y=log total compensation | | | |
|--------------------------------------|--------------------------|-------------------|------------------|------------------|
| | (1) | (2) | (3) | (4) |
| <i>CEO characteristics</i> | | | | |
| Female | -0.0542(-2.23)* | -0.0433(-1.18) | -0.0570(-1.56) | -0.0770(-1.35) |
| Age | 0.0440(10.57)** | 0.0418(10.20)** | 0.0493(10.79)** | 0.0666(8.96)** |
| Age squared | -0.0003(-9.31)** | -0.0003(-8.86)** | -0.0003(-9.83)** | -0.0005(-8.73)** |
| Tenure | 0.0175(15.05)** | 0.0165(14.33)** | 0.0037(4.60)** | 0.0104(7.95)** |
| Tenure squared | -0.0005(-13.57)** | -0.0004(-13.24)** | -0.0001(-6.03)** | -0.0001(-2.30)* |
| <i>Firm characteristics</i> | | | | |
| Sales | | | 0.0000(11.34)** | 0.0000(8.50)** |
| # of Employees | | | 0.0009(6.26)** | 0.0005(2.36)* |
| Market Value | | | 0.0000(8.87)** | 0.0000(0.53) |
| Return on Assets | | | 0.0007(3.31)** | 0.0001(0.31) |
| Sales 3 Yr Growth Rate | | | -0.0001(-1.94) | 0.0000(-0.76) |
| 3 Yr Ret to Shareholders | | | 0.0023(14.52)** | 0.0023(16.99)** |
| Constant | 1.241(8.97)** | 1.309(9.60)** | 1.014(6.29)** | 0.341(1.26) |
| Firm control? | NO | NO | NO | YES |
| Firm characteristics control? | NO | NO | YES | YES |
| Industry control? | NO | YES | YES | YES |
| Year control? | YES | YES | YES | YES |
| Observations | 19302 | 19302 | 11694 | 11694 |
| Adj. R-squared | 0.114 | 0.167 | 0.283 | 0.620 |
| Standard error | 0.483 | 0.468 | 0.423 | 0.308 |

Notes: The dependent variable is the natural logarithm of total compensation and the compensation figures are deflated by the annual Consumer Price Index (CPI) for each year (base year is 1992). Total Compensation includes base salary, bonuses, stock grants, stock options, long-term incentive pay, and all other forms of total annual compensation.

Firm control in column 4 is according to GVKeys; industry control is by 2-digit SIC code.

Robust t-statistics are presented in parentheses.

*Estimated coefficient or T-statistic is significantly different from zero at 5% level.

**Estimated coefficient or T-statistic is significantly different from zero at 1% level.

5.3 Salary mix regression

Table 6 Regression Results on Ratio of Salary in Total Compensation for CEO

| Independent variables | Y = salary/total compensation | | | |
|--------------------------------------|-------------------------------|--------------------|--------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| <i>CEO characteristics</i> | | | | |
| Female | 0.0313(2.54)** | 0.0129(1.05) | 0.0088(0.44) | 0.0518(1.77)* |
| Age | -0.0213(-10.13)*** | -0.0209(-10.01)*** | -0.026(-10.59)*** | -0.0340(-7.30)*** |
| Age squared | 0.0002(10.59)*** | 0.0002(10.42)*** | 0.0002(11.31)*** | 0.0003(8.06)*** |
| Tenure | -0.0023(-3.85)*** | -0.0019(-3.16)*** | 0.0028(6.20)*** | 0.0000(-0.03) |
| Tenure squared | 0.0001(6.36)*** | 0.0001(6.42)*** | -0.0002(-4.42)*** | 0.0000(-1.63) |
| <i>Firm characteristics</i> | | | | |
| Sales | | | 0.0000(-5.43)*** | 0.0000(-4.13)*** |
| # of Employees | | | -0.0003(-3.89)*** | -0.0002(-1.24) |
| Market Value | | | 0.0000(-2.78)*** | 0.0000(2.55)** |
| Return on Assets | | | -0.0003(-2.97)*** | 0.0006(0.43) |
| Sales 3 Yr Growth Rate | | | 0.0000(0.79) | 0.0000(-0.44) |
| 3 Yr Ret to Shareholders | | | -0.0015(-17.99)*** | -0.0015(-17.84)*** |
| Constant | 1.12(16.02)*** | 1.11(15.88)*** | 1.31(14.84)*** | 0.94(6.27)*** |
| Firm control? | NO | NO | NO | YES |
| Firm characteristics control? | NO | NO | YES | YES |
| Industry control? | NO | YES | YES | YES |
| Year control? | YES | YES | YES | YES |
| Observations | 19302 | 19302 | 11694 | 11694 |
| Adj. R-squared | 0.06 | 0.10 | 0.18 | 0.43 |
| Standard error | 0.24 | 0.24 | 0.23 | 0.19 |

Notes: The dependent variable is the ratio of salary in total compensation and the compensation figures are deflated by the annual Consumer Price Index (CPI) for each year (base year is 1992). Total Compensation includes base salary, bonuses, stock grants, stock options, long-term incentive pay, and all other forms of total annual compensation. Firm control in column 4 is according to GVKeys; industry control is by 2-digit SIC code. Robust t-statistics are presented in parentheses.

* Estimated coefficient or T-statistic is significantly different from zero at 10% level.

**Estimated coefficient or T-statistic is significantly different from zero at 5% level.

***Estimated coefficient or T-statistic is significantly different from zero at 1% level.

In order to know how much of total compensation is made of base salary, we perform salary mix regression in Table 6. Female CEOs have higher salary proportion in total compensation than their male counterparts; the difference in gender is statistically significant when firm-fixed effect is added (in column 4). The result suggests that female CEOs are actually more risk-averse because they were paid more fixed salary instead of performance-based compensation (such as bonus and options).

Conclusion

Gender pay gap is still a debated topic and many economic researchers and corporate managers are interested in knowing whether it exists. It is generally explained by several reasons, such as the explicit discrimination, differences in education backgrounds, different positions held by male and female or women's career choices. In this paper, we focused on the top executive position CEO, analyzed the gender differences in base salary, total direct compensation and salary mix, and showed these differences vary within industries, firms and over time.

We found that even though there is a decreasing trend of female CEOs in recent three years, the percent of female CEOs is still almost twice compared to a decade ago. With regards to total compensation, the average female still earns less than the average male, but the difference between them has shrunk noticeably and is not statistically significant. Besides, we found an interesting result that female CEOs earn more base salary than male CEOs and the earning difference is statistically significant. Given their minor difference in total compensation, female CEOs actually earn less performance-based compensation such as bonuses, stocks and options. A reasonable

explanation is female CEOs are more risk-averse than their male counterparts. On average, female CEOs are younger and hold the position for a shorter time than their male counterparts, and firms operated by female are not necessarily significantly smaller (in terms of net sales, number of employees, market value and return on asset) than those that are run by male. We also find some significant evidence that firms have better performance (by three-year growth rate of sales and three-year return to shareholders) if their CEOs are male. Besides, female representation in the position of CEO is found seldom occupied in agriculture, mining, construction and wholesale trade, and largely engaged in manufacturing, finance and services. Despite such differences, we still found no significant gender discrimination or bias on female in base salary and total compensation at CEO level.

However, there are still limitations. First, using age and tenure as the proxies for CEO's experience may partially torture the reality, since the relevant working experience is difficult to quantify and display. Besides, we are unable to definitively pinpoint the source of some disparities between men and women due to the lack of education, human capital, family status, and labor supply data. Second, the WRDS database only provides EXECUCOMP statistics of S&P 500 firms for the years 1992-2013, we did not perform analysis on the small and medium-sized companies.

Ensuring the gender equality in compensation is important, because female are entitled to be compensated fairly through equally hard work and contributions to firms. Persisting discrimination on female concerning relative compensation will discourage female and deteriorate the productivity and efficiency of labor market as a whole.

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